Strand C *MEASUREMENT* Introductory Problems

We have developed a number of problems that are related to the concepts in this strand. You can use these as an introduction to the work that follows and we recommend that you work on them with colleagues.

The problems are designed to encourage mathematical thinking. You can also use them with your classes.

1. For each of the shapes shown opposite, make a figure that has exactly the same shape and whose

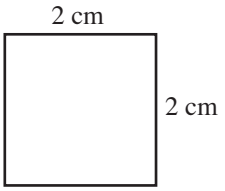
a) perimeter is twice as long

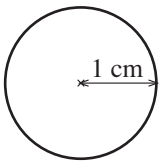
b) perimeter is 4 times as long

c) area is twice as large

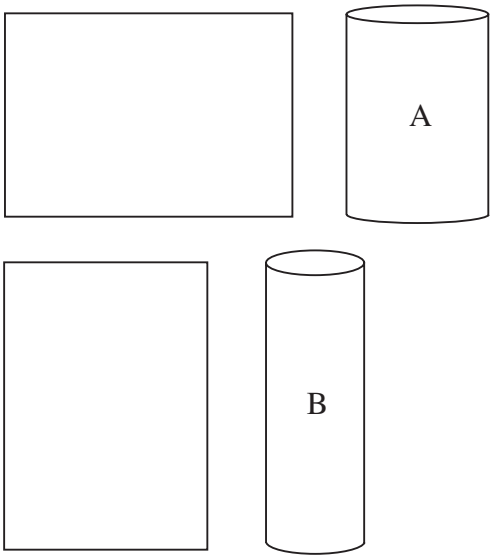
d) area is for times as large.

In each case, explain your reasoning.





2.



An A4 sheet of paper can be rolled up into a cylinder in two ways.

Which has the greater volume - cylinder A or cylinder B?

Or perhaps the volumes are the same?

How can you decide?

3. The Smith family have just moved into a new home with a large lawn. They need to sow grass seed. The problem is that they are not sure how to work out how much seed they need. At their old house, they knew that the lawn was 3 m by 6 m and needed 2.5 kg of seed. Their new lawn is 30 m by 15 m.

How will knowing the amount of seed needed for the lawn at their old house help them when buying seed for the new lawn?

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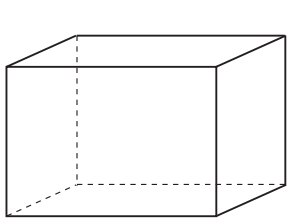
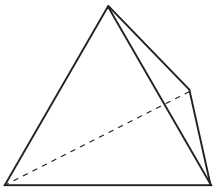
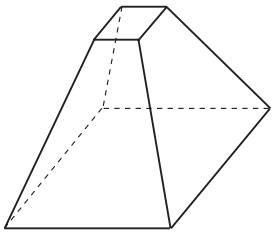
4. Several solids are shown below. Choose the solids that share characteristics with solid B and write down the characteristics.



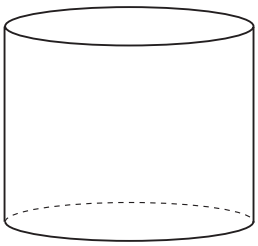
A



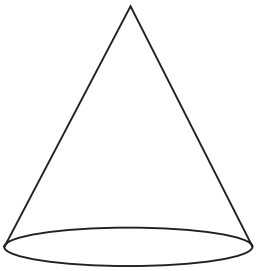
B



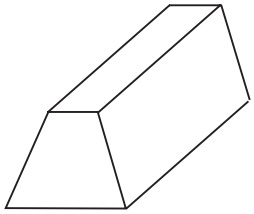
C



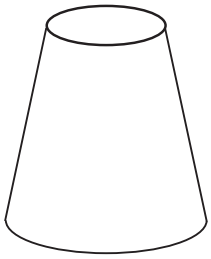
D



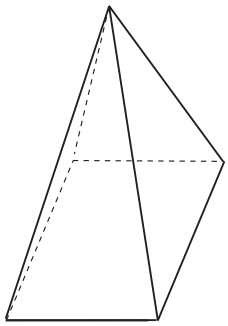
E



F



G



H

5. Draw a shape using 9 unit squares which has a perimeter length:

a) as small as possible

b) as large as possible.

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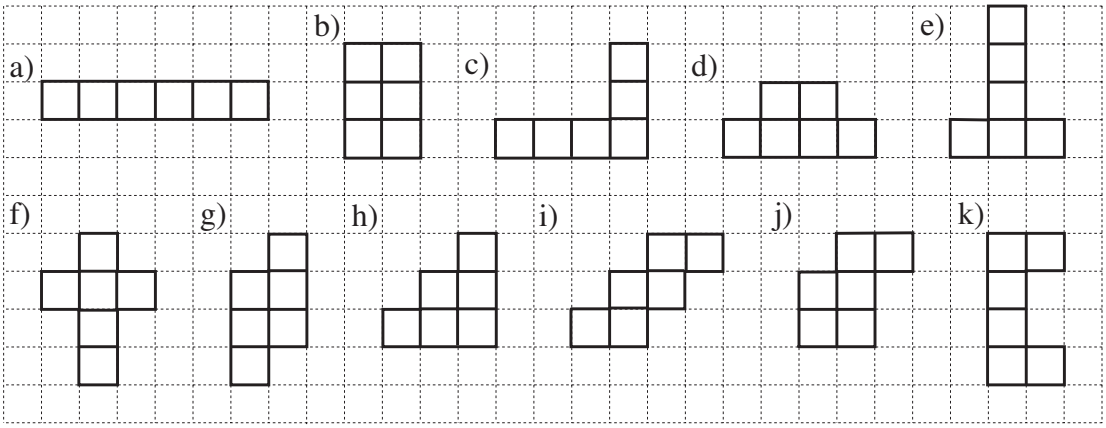
6. The volume of a cuboid is 36 unit cubes and its edges are a whole number of units.
How long could its edges be?

7. **Hexominoes** are formed by connecting 6 squares along at least one side.
Here are 11 examples of different hexominoes.

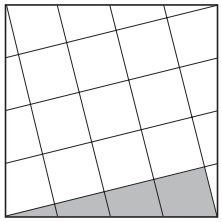


a) How many more hexominoes can you find?

b) How many of all the hexominoes can be used for the net of a cube?

8. The sides of a square are each divided into 4 equal parts.
Some of the points are joined up as shown in the diagram.

What part of the area of the whole square is the area of the shaded part?



9. How can this rectangle be cut into two pieces so that the two pieces will form a square?